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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/802,975	03/12/2001	Haroon Ahmed	2369/31	6943

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KENYON & KENYON
1500 K STREET, N.W., SUITE 700
WASHINGTON, DC 20005

EXAMINER
LEYBOURNE, JAMES J

ART UNIT	PAPER NUMBER
2881	

DATE MAILED: 01/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

Office Action Summary	Application No.	Applicant(s)	
	09/802,975	AHMED ET AL.	
	Examiner	Art Unit	
	James J. Leybourne	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 March 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Information Disclosure Statement

1. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-18, 23-25 and 27-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Driskill-Smith (reference "U" on PTO-892) in view of Jin (USPN 6283812 B1). In figure 1(d), Driskill-Smith discloses a source that has all of the limitations of claim 1 except for a specimen adjacent the source, to receive a flux of charge carriers from the source.

With respect to claims 1-7, 11-18, 23-25 and 38:

The emitter (nanopillars) and extractor (second layer) are on a common substrate (bottom layer)

The emitter has a tip radius about 1 nm (¶ 3)

The extractor (top layers) is 30 nm from the emitter (figure 1)

The charge carriers (field emitted electrons) are extracted while a bias is applied to the extractor relative to the emitter

The relative applied bias (15 volts) is between 7 to 20V (figure 2).

The emitter comprises a metal (tungsten) with a tip member comprised of an alloy of gold and palladium (¶ 4)

The extractor comprises a metal (tungsten) and comprises a sheet with a 50 nm aperture (¶ 4).

Driskill-Smith does not teach a specimen adjacent the source to receive a flux of charge carriers from the source.

Jin teaches that a promising application of field emitters is thin, matrix-addressable, flat panel displays. He discloses an apparatus for producing a flux of charge carriers for use in a flat panel display (figure 11). This source comprises an electron field emitter having a nanometer scale tip radius on a common substrate. The flat panel display also comprises an anode (specimen **116**) that receives the electron flux. It would be obvious to one of ordinary skill in the art at the time of the invention to configure the source taught by Driskill-Smith adjacent the anode (specimen) of a flat panel that receives the flux of charge carriers from the source as taught by Jin.

Regarding claims 8-10, Jin discloses a power supply **126** to bias the anode **114** relative to the cathode **110**. Since the charged particle flux collected by the anode is electrons, it is inherent that the bias of the anode is positive.

Regarding claim 10, the bias between the emitter and the specimen is a design choice that depends on the application.

Regarding claims 27-35, Driskill-Smith teaches that if the dimensions of the source is less than the mean free path of electrons in air (about 200 nm at atmospheric pressure) and the operating voltage is less than the first ionization potential of molecules present, the source can be operated at atmospheric pressure and the source will not cause ionization of the air.

Regarding claims 37, the turn on bias of the Driskill-Smith source is 7.5V (¶ 8).

Regarding claim 39, Driskill-Smith also discloses the method comprising depositing a thin film and allowing said thin film to coalesce into individual particles.

4. Claims 20 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Driskill-Smith in view of Jin as applied to claim 1 above, and further in view of Chang (USPN 5122663). Chang discloses an electron beam imaging system which employs an integrated microlens/secondary electron detector for improved imaging and is suitable for use as a read-write head in an electron beam-based data storage system (figure 1). His apparatus comprises an electron source with a tip **18** and a microlens that focuses the electrons emitted from tip **18** onto a conductive surface **26** of sample **14** and cause secondary electrons to be emitted therefrom. Those secondary electrons travel back towards the underside of microlens **12** and impinge upon a conductive region **28** separated from annular conductor **24** by a layer of dielectric material

30. A secondary electron detector is formed on the surface of the electrostatic lens that is closest to the conductive target.

It would be obvious to one of ordinary skill in the art at the time of the invention to add a collector to the source disclosed by Driskill-Smith in order to produce a device that is suitable for use as a read/write head for applications that require a secondary electron imaging capability.

Regarding claim 26, the separation between the apparatus for producing a flux of charge carriers and the specimen is a design choice that depends on the specific application.

5. Claims 19, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Driskill-Smith in view of Jin as applied to claim 1 above, and further in view of Kruit (USPN 5587586). Kruit discloses an electron source characterized in that the extraction-electrode is mechanically integral with further particle-optical elements for manipulating the beam of free electrons (column 7' lines 14-32). On its side, that is remote from the needle, the extraction-electrode is provided with a variety of conductive and/or insulating patterns, which constitute electron-optical components.

In figure 5, he shows an electrode configuration, which is mechanically integral with the extraction-electrode **22**. On the extraction-electrode there is provided a layer of insulator material **50** on which there is arranged a conductive ring **52**. Via this ring an extraction field can be applied so as to accelerate the electrons after departure from the extraction-electrode. A second concentric

ring **54** can be used to exert a focusing effect on the beam and it is also feasible to split this electrode **54** into segments so as to form a deflection field.

It is well known in the art that many applications, for example electron microscopy, require that a focused electron beam be scanned across the surface of a specimen. It is also known that deflecting an electron beam is much faster than using mechanical scanning. Therefore, in order to reduce scan time inapplications requiring surface scanning, it would be obvious to one of ordinary skill in the art at the time of the invention to modify the source disclosed by Driskill-Smith to include a lens for focusing the electrons and a deflector for deflecting the electron bean as taught by Kruit.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James J. Leybourne whose telephone number is (703) 305-7067. The examiner can normally be reached on M-F 9:00 - 6:30. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on (703) 308-4119. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9317 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JJL

January 9, 2003

JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800